

FINANCIAL DEEPENING AND MONETARY POLICY IN AFRICA (DYNAMIC PANEL ANALYSIS)

Foluso. A. AKINSOLA

Postdoctoral Researcher, Department of Economics, University of South, South Africa

Lecturer at Department of Economics, University of Lagos, Nigeria

Email: akinfolu@yahoo.com/akinsfa@unisa.ac.za

Abstract

After the catastrophic consequences of the global financial crisis on the financial market, the effectiveness of the monetary policy in curbing price volatility and ensuring financial stability is in question. Therefore, the paper examines the impact of financial development on monetary policy in Africa. Unlike the previous studies, we attempt to capture financial reforms in different African countries from 1980 to 2016, including the banking crisis period. Using dynamic panel data analysis, our results show that there is a positive correlation between financial deepening and the monetary policy (lending interest rate, output gap and inflation rate used as a proxy) in Africa. The effect of monetary policy is significant and positive. However, banking crisis dummy is found to be negative and significant. This result applies irrespective of whether domestic credit to the private sector or money supply was employed as a proxy for measuring financial deepening.

Keywords: Financial deepening, economic growth, monetary policy, dynamic panel-analysis

JEL Classification: E44, O16; E52; C58

1. Introduction

The integrated nature of the financial market has made the roles of the central banks more complex and onerous over the years. After two decades of stabilising financial volatility, especially after several crises in East Asia, Latin American and the recent financial crisis of 2008, it is essential to raise questions about the role of financial monetary policy in financial deepening. For instance, any change in the advanced economy central bankers policy rates (where financial deepening is mature and complex) affects and Spillover to the emerging market. This is well documented in the literature. Many studies such as Ahmed and Zlate (2013), Forbes and Warnock (2010), Fratzscher (2011), and Ghosh, et al. (2012) have documented the importance of global factors such as advanced economy interest rates in affecting the financial system of small open economies.

After several years of negative real interest rates, similar complaints were lodged, and some may partly trace the financial crises in Latin America and subsequently in East Asia). Interest rates in AEs can spill over more generally. These occur through asset prices and quantity (capital flows) channels, more than basic models “predict”. The behaviour of internationally active banks important, as they drive (gross) credit flows, leading to booms/busts. Exchange rate regime does not fully insulate this crisis. Some countries “Monetary policy (MOP)” are not fully independent, e.g., even with floating exchange rate, still local impacts. Risks can arise to economic and financial stability. Bolvin and Giannoni (2004); Carranza et al (2005); Batuo and Mlambo(2010); Angelopoulou(2014) have all studied the impact of monetary policy on the financial system. Their results have been contradictory depicting that changes in the policy of reserve banks can accentuate and impact the financial system.

The financial system in Africa has developed and evolved over the years to withstand and survive series of banking crises. However, the pivotal role played by most central banks’ monetary policies are mainly hinged on the survival and development of the financial system. For instance, Ma and Lin (2016) suggest that any policy that affects the financial development will ultimately have a concomitant effect on the “transmission mechanism” of the monetary policy. Some studies have established that the strength of the monetary policy lies mainly on the stage and structure of financial development (Carranza et al. 2010; Krause and Rioja, 2006). However, after the global financial crisis, many economies have adopted an expansionary monetary policy of low interest rate (and low inflation rate) but these policies have not induced the aggregate demand. Can monetary policy increase risks or enhance financial deepening in Africa

Therefore, the assessment of the nexus between the financial deepening and monetary policy becomes crucial to make coordinated policies for many countries in Africa. The issue of monetary policy and financial deepening has received very little attention both empirically and theoretically. Unlike previous studies, we attempt to capture financial reforms in ten selected middle-income African countries including banking crisis period. We deliberately did not include stock market as a proxy for measuring financial development because the stock market is still at a novel stage in most African countries.

The monetary policy mechanisms are instruments adopted by the central bank to influence investment spending and aggregate demand in an economy through the changes in money supply and policy induced interest rate (Ncube, 2008). Theoretical literature is abreast with the four main channels of monetary policy mechanism namely: interest rate channel; credit channel; exchange rate channel and asset price channel. However, most empirical literature is still concerned about the effectiveness of one channel over the other and predominance of one channel over the other in the financial system especially for a small open economy (Carranza et al. 2010). The traditional interest rate channel and the demand for money have not been an effective tool in Africa over the years because of the weak responsiveness of aggregate demand and level of financial development in most African countries (Khan, 2011). Most theories have shifted focused on the credit channel away from the traditional monetary and interest rate channel. The credit channel of monetary policy seems to be more relevant and responsive in Africa such that it amplifies the impact of monetary policy shocks to the real sectors through the borrower's net worth and the external finance premium. For instance, central banks still set a high spread between the deposit rate and lending rate and these to have a high implication for the borrowers (cost of borrowing) and availability of credit (especially to small and medium scale (SMEs) in SSA countries.

Many central banks in Africa have adopted different strategies to curtail price volatility and ensure financial stability. For many central banks in SSA, short-term domestic interests rates are being been mainly implemented to modify the household's consumption and investment pattern. For others, it is the exchange rate and in countries with Islamic banking systems, the profit rate can be used as an operational target. South Africa, Ghana, and Uganda are the only countries that have adopted inflating targeting strategy to curb price volatility. Many Central banks in Africa are moving into the forward-looking monetary framework and greater monetary independence with little fiscal interruption (more flexibility in the exchange rate and discretionary policies). Some Central banks prefer dual objectives of price stability and high short run employment but there seems to be a conflict between these two goals since price volatility or high inflation distorts the real sector's ability to invest or save which can ultimately affect economic growth. However, since most countries in SSA are still a small open economy, they are still vulnerable to external shocks (distortion in commodity prices; drought, exchange rate volatility, volatility in capital flows). Therefore, the paper examines the nexus between monetary policy and financial development across countries in Sub-Saharan African countries. Unlike the previous studies, we attempt to capture financial reforms in different African countries from 1970 to 2016, including the banking crisis period. Using dynamic panel data analysis, our results show that there is a negative correlation between financial development and the monetary policy (lending interest rate used as a proxy) in SSA.

The rest of the paper is organised as follows. Section 2 gives a brief summary of the theoretical literature on monetary transmission Mechanism and financial development. Sector 3 develops econometric models that enable the testing of the nexus between financial development and monetary policy. Section 4 concludes and discusses some policy implication.

2. Literature Review

Over the past two decades, many African countries have liberalized and deepened their financial market by stabilizing inflation and promote macroeconomic stability and growth. Svirydzienka (2016) points out that financial development is a multidimensional process and the modern financial system has become multifaceted (banks, stock market, money market, investment banking, pension fund and venture capital market). However, the monetary policy effectiveness is been challenged

The financial market plays a significant role in efficiently circulating funds from lenders to borrowers, fostering economic growth and development. It is a common predication that without a functional financial market, the economy cannot grow or develop (Ikhide, 1992, Ikhide & Alawode, 2001; Levine, 2005; Rajan and Zingales, 1998; Beck et al., 2000, 2004; Knoop, 2008). Essentially, the financial market provides liquidity (Block and Herts, 2002), and contributes to the capital formation and investment risk reduction by offering opportunities for portfolio and risk diversification (Levine, 1991). The financial system also acts as a connector to bridge the gap between borrowers and savers.

Empirical evidence has shown that higher levels of financial development stimulate long-run growth (see Schumpeter, 1911; Gurley and Shaw, 1955; Goldsmith, 1969; Hicks, 1969; McKinnon, 1973; King and Levine, 1993a; Levine and Zervos, 1998; Rajan and Zingales, 1998). While some schools of thought believe that finance does not engender growth (Robinson, 1952; Lucas, 1988), Goldsmith (1969) established in a cross-country study of 34 countries that the financial system is a significant contributor to economic growth. However, the study did not detect any relationship between economic growth and financial structure. King and Levine (1993b) later replicated the work of Goldsmith (1969) to a sample size to 77 countries, using a different scope of financial development measurements (credit to the private sector over GDP, liquidity liabilities over GDP, bank credit over bank credit plus central bank domestic assets). The results show a positive relationship between each financial measure and economic growth.

The financial system in the African countries has gone through tremendous structural reforms, since the mid-1980s, moving from the period of financial repression, liberalising interest rate, credit allocation and exchange rate, privatisation of state owned development and commercial banks to a period of heightened financial innovation and infrastructural development. However, for the monetary policy to be effective and sustainable in SSA countries, the banking system has to boost their financial depth (private sector credit to GDP and liquidity liability to GDP), reduce the transactional cost and improve the overhaul structure of the financial system. Some authors strongly believe that monetary policy is highly irrelevant and ineffective in Sub-Saharan Africa, because of the absence of a domestic bond market to sell government securities in most of the financial system in Africa. Most African countries result to adjusting their domestic interest rate to influence the real sector (Weeks, 2010; Ma and Lin, 2016). For example according to Weeks (2010), across 46 African countries,

the median ratio of domestic credit to GDP was 13% between 2000 to 2008 (with the exceptions of Mauritius, Seychelles, and South Africa). According to the monetary view, most monetary policy shock is only effective in affecting the real sector of any economy through changes in bank deposits and loans, which is highly dependent on a well-functioning and mature financial system.

There are several issues that made that African financial system peculiar and worth studying. First, most African financial system has a weak and immature stock market; therefore, most of the reserve bank policy instruments are limited, weak and unresponsive (Mukherjee and Bhattacharya, 2011). Second, the banking system has a high cost of the transaction, low level of competition and high inflammation asymmetry. These characteristics have made most Africa financial market to be vulnerable to external shocks and at the same time still open to potential growth and capital inflow (Bernanke and Gertler, 1995; Aretis et al .1997; Levine, 1995, 2003). The central bank responds to financial market frictions and implements unconventional monetary policy through the balance sheet channel. Risk taking channel posits that contractionary monetary policy can encourage investors and household to take on more risk which can enhance economic activities but can also affect the effectiveness of the monetary policy to ensure financial stability ultimately (Bernanke and Gertler, 1995; Aretis et al .1997; Levine, 1995, 2003; Aysun et al. 2013; Adrian and Lang, 2014 ; Ansart and Monvoisin, 2016; Ma and Lin, 2016). The financial market plays a significant role in efficiently circulating funds from lenders to borrowers, fostering economic growth and development. It is a common predication that without a functional financial market, the economy cannot grow or develop (Ikhide, 1992, Ikhide & Alawode, 2001; Levine, 2005; Rajan and Zingales, 1998; Beck *et al.*, 2000; Knoop, 2008). Essentially, the financial market provides liquidity and contributes to the capital formation and investment risk reduction by offering opportunities for portfolio and risk diversification (Levine, 1995).

The credit channel plays a crucial role in the transmission of monetary policy in order to achieve the main macroeconomic objectives of economic growth and financial stability. Empirical evidence has also demonstrated that a deeper credit fosters financial deepening and can help augment economic development, especially through a well-developed credit market. Supply-side driven economic growth holds that an economy with better access to credit will increase productivity and capital accumulation (Schumpeter, 1911; Levine, 1997; Hansen and Sull, 2013). For example, King and Levine (1993b) established a positive relationship between credit market depth and economic growth. Hansen and Sull (2013) studied credit growth in Latin America using variables such as private credit to GDP level ratio and emphasised the special role of private credit in economic development.

In conclusion, there seems to be broad consensus that a developed financial system that provides credit will enhance growth and development. However, credit market problems arise because of market failure, information asymmetry, and credit rationing. These have caused biased bank lending and the central banks tend to use the monetary policy instrument to constrain credit in the system.

Table 1: Selected empirical literature on monetary policy and financial development in SSA

Authors	Country	Period	Variables	Methodology	Conclusion
Angelopoulou et al (2014)	Euro Area	2003-2011	Financial Condition index(FCI); interest rate, interest rate spread, credit quantities	Principal Component Analysis,	FCI impact differs across EU Area after the global financial crises
Carranza, Galdon-Sanchez & Gomez-Biscarri(2010)	53 countries	1986-2005	Central bank assets, private credit to GDP, Bank deposits	Non-hierarchical Cluster analysis, dynamic panels, VARIMAX	MP has a larger impact when financial system is developed but impact of changes in MP are larger in smaller countries (with small central bank)
Ma and Lin	41 economics	2005Q1-2011Q4	Domestic credit to GDP, stock market capitalization To GDP, Crisis dummy, inflation rate, GDP	Pooled least square, Fixed effect, random effect,	Effect of MP on output and inflation are significantly and negatively correlated showing declines in the effect of MP
Jawadi, Mallick, and Sousa	BRICS Countries	1990Q1-2012Q2	Real GDP, Government spending, interest rate, price deflator, CB rate, M2	Panel VAR Approach	Unexpected increase in Central bank rate in real economic activities, inversely affecting the spillover between fiscal and monetary policies
Batuo and Mlambo	53 African Countries	1985-2010	Real per capital GDP growth, dummy variable for Financial liberalisation and dummy variable for banking crises;	Treatment effect, two step methods, and a panel probit method.	Results show banking crises have negative impact on economic growth while financial liberalisation tend to reduce banking crises

3. Data

3.1 Data Measurement and Sources

We investigate the nexus between monetary policy and financial deepening across countries in African countries. To estimate the model, this study employs panel data of 10 middle-income countries in Africa. Over the period of 1980 to 2016. The date set is collected mainly from The World Bank Indicators (WDI). Some of the missing data from 2016 were extrapolated. For monetary policy proxy, this study uses interest rate and inflationary gap (lr, inf_cpi, and Inf_gdp), for financial deepening proxy, this study uses indicators such as the ratio of liquid liabilities of financial intermediaries to GDP (m2_gdp), which is a measure of overall financial depth. The ratio of domestic credit to the private sector as a share of GDP (dc_gdp) is also employed as a proxy for financial development because it accurately captures the extent of financial intermediation in an economy.

Economic growth is defined by the rate of growth of Income Per Capita (ggdp). To account for control variables in the monetary process, the study employed the following variables: foreign direct investment as a share of GDP (fdi_gdp), inflation as a share of consumer price index (inf_cpi), inflation as a share of GDP (inf_gdp), investment (gfcf_gdp). We also employed the crisis dummy following Leaven and Valancia (2012) database where the author detailed a comprehensive crisis episode. We excluded the exchange rate gap because different African countries are still employing different exchange rate policies.

3.2 Modelling

We specified the relationship between financial development and monetary policy following theoretical and empirical modelling in an econometric framework by following previous literature by Carranza, et al. (2010). We followed a dynamic panel modelling where we examined whether financial development has a significant impact on monetary policy in SSA:

$$FD_{it} = \beta_1 (MP)_{1,it} + \beta_2 (INF_CPI)_{2,it} + \beta_3 (INF_GDP)_{3,it} + \beta_4 (FDI_GDP)_{4,it} + \beta_5 (Crisis)_{5,it} + \beta_6 (CV)_{it} + \epsilon_{it},$$

Where MP_{it} is the monetary policy measurement (lending rate), the inflationary gap (INF_{cpi}) for consumer price index and price deflator (INF_{gdp}), FD_{it} is the Financial development measures (dc_gdp and $m2_gdp$), $GGDP$ is the per capita income growth proxy for output gap. We explore panel regression model following an empirical investigation from other similar studies. Panel regression can be estimated using fixed data, and random data. The dynamic panel model (in which all the variables are in first difference) is estimated following the Arellano–Bond approach was also employed. We use the overall sample, which comprises of selected 10 middle-income African countries. The results as shown in the lower section of tables 6 and table 7 consistently indicate that the individual unobserved country-specific effects are uncorrelated with the regressors, suggesting that the fixed effects model is preferable to the random effects model for the levels regression estimates. Hence, for the levels estimates, we only consider the results from the fixed effects estimates in our discussion of findings. For the dynamic model, the results from the Sargan tests as shown in the lower portion of tables 8 indicate that the

instruments are valid in all the dynamic panel regressions. Finally, the test for second order serial correlation shows no problem of serial correlation in the residuals from the dynamic panels' regressions.

4. Empirical Result and interpretation

Macroeconomic variables are subjected to Im, Pearson and Shin and Levin-Lin Chu unit root test stationarity test to avoid spurious regression estimate, even in panel estimations. The panel unit root test has become very crucial to assess the characteristics of various variables and derive panel specific result. The null hypothesis for the unit root test is that the series contains a unit root, and the alternative is that the series is stationary. The Levin-Lin-Chu test assumes a common autoregressive parameter for all panels. The result in table 2 shows that all the variables except domestic credit to private sector (dc_gdp), money supply to gdp (m2_gdp) and gross fixed capital formation (gfcg_gdp) are stationary at levels.

Table 3 shows pair wise correlation matrix, which depicts correlation coefficient between the variables. The correlation matrix table is essential to avoid multicollinearity problem and take account of cross sectional dependence between variables in a panel dynamic system. M2_gdp and dc_gdp have a high correlation of 0.65. Like we expected consumer price index (inf_cpi) and Gdp deflator (inf_gdp) are also highly correlated.

Table 2: Im-Pesaran and Shin W-stat Unit root Test

Variables	Im-Pesaran and Shin W-sta Stationarity Test	Levin-Lin Chu Unit root test	Result
dc_gdp	-2.445**	-4.0673***	I(1)
m2_gdp	-1.8721***	-1.6857**	I(1)
lr	-0.9786	9.5251***	I(0)
gddp	-5.1323***	-9.5375***	I(1)
fdi_gdp	-2.6662***	-3.7179***	I(1)
gfcg_gdp	-3.5999***	-0.7885*	I(1)
Inf_cpi	-4.7962***	-9.9924***	I(1)
Inf_gdp	-5.4849***	-12.5060***	I(1)

Note: *and * indicate statistical significance at 1% and 5% level**

Table 3: Pair-wise Correlation Matrix

Variables	M2_gdp	Dc_gdp	ggdp	Fdi_gdp	Gfcf_gdp	Inf_cpi	Inf_gdp	lr
m2_gdp	1.00000							
dc_gdp	0.5913	1.0000						
ggdp	0.0569	-0.0311	1.0000					
fdi_gdp	0.1666	0.1298	0.0530	1.0000				
gfcf_gdp	-0.1543	-0.0468	0.0711	0.0263	1.0000			
inf_cpi	-0.0136	-0.1148	-0.0777	-0.0156	-0.5673	1.0000		
inf_gdp	-0.01146	-0.1275	-0,1789	-0.0459	--0.2760	0.5673	1,0000	
lr	-0,0219	-0,0100	-0,0038	0,00530	0,02892	-0,02747	-0,0898	1.0000

Table 4: Pedroni Cointegration test

Cointegration Statistic	Value
Panel Statistic	
Panel v-Statistic	-1.638*
Panel rho-Statistic	0.589
Panel PP-Statistic	-2.661**
Panel ADF-Statistic	-2.400**
Group Statistics	
Group- rho Statistic	1.190**
Group- PP Statistic	-3.074**
Group- ADF Statistic	-2.795**

Note: *and * indicate statistical significance at 1% and 5% level**

The unit root test in Table 2 shows that the variables follow both I (0) and I (1) process. To ascertain if the variables are cointegrated, we employed Pedroni (1999, 2004) test in a balanced panel since it allows heterogeneity among the individual countries. Seven tests statistics of Pedroni Cointegration are reported in Table 4. The tests show that there is a long run cointegration across the panel countries since only five Pedroni tests out of the seven tests statistics rejects the null of no-cointegration at 10% level of significance.

Table 5: Pedroni PDOLS (Group mean Average)

Variables (time and trend)	t-statistics
ggdp	4.48***
lr	7.43***
fdi_gdp	4.49***
Inf_gdp	-1.21
gfcf_gdp	5.18***

Note: *and * indicate statistical significance at 1% and 5% level**

This study adopted the Dynamic OLS estimator since OLS estimator is biased (given the endogeneity and autocorrelation problem) and can give an inconsistent result in the panel analysis. The fully modified OLS approach of Pedroni (2001, 2004) can give a better estimator. Table 5 shows that all the control variables except infltaion have a long run relationship with domestic private credit to gdp.

Our result in table 6 shows that there is a positive correlation between financial deepening (dc_gdp) measures and monetary policy measures in SSA. As the financial sector develops, there is more competition and less distortion in the financial market. The financial sector responds positively by lowering the cost of lending and reducing the interest rate with ease.

For robustness of the test, we employed two components of financial development measure (m2_gdp and dc_gdp). From table 6 and 7, we see that the lending rate is positively related to the financial intermediaries but not significant. Other control variables (foreign direct investment and investment are clearly significant. The financial crisis dummy is also clearly significant and negatively correlated with the financial development. This result clearly shows the effect of the various banking crisis on monetary policy.

Turning to table 8, the dynamic model was employed to capture the potential endogeneity problems associated with dynamic panel regression. The result confirms our previous result in table 6, that financial development has a statistically positive effect on monetary policy measures. However, the contemporaneous linkage of

dc_gdp is positive and significant for selected middle-income countries in Africa. Our result is similar and complements other works (e.g Ma and Lin, 2016; Carranza et al. 2010; Fowowe, 2011; Odhiambo, 2014 and Batuo and Mlambo, 2010).

5. Conclusion

The paper examined the relationship between the financial deepening and the monetary policy gave the output and inflationary gap. The issue of monetary policy effectiveness has received very little attention by policy makers and in various theoretical studies. This study used dynamic panel data analysis to examine the nexus between financial deepening and monetary policy nexus in selected middle-income countries in Africa. Our results show that there is a positive correlation between financial deepening and the monetary policy (lending interest rate and inflation used as a proxy). Unlike the previous studies, we attempt to capture financial reforms in different African countries from 1980 to 2016. As the financial sector develops; there are more competition and less distortion in the financial market. The financial sector responds positively by lowering the cost of lending and reducing the interest rate with ease. Considering the crucial role played by most financial intermediaries in developing countries, the result has some implications for different African countries especially for economies still undergoing different financial reform. It will be interesting to measure the same model using low income countries.

References

- Adeniyi, O., Oyinlola, A., Omisakin, O. & Egwaikhide, F.O. (2015). Financial development and economic growth in Nigeria: evidence from threshold modelling. *Economic Analysis and Policy*, 47, pp. 11–21.
- Adrian, T. & Liang, N. (2014). Monetary policy, financial conditions, and financial stability. *FRB of New York Staff Report*, (690).
- Allen, F. & Gale, D. (2000). *Comparing financial systems*. New York: MIT Press.
- Altunbas, Y., Gambacorta, L. & Marques-Ibanez, D. (2010). Does monetary policy affect bank risk-taking? *SSRN Working Paper Series*.
- Angelopoulou, E., Balfoussia, H. and Gibson, H.D. (2014). Building a financial conditions index for the euro area and selected euro area countries: what does it tell us about the crisis?. *Economic Modelling*, 38, pp.392-403.
- Ansart, S. and Monvoisin, V. (2017). The new monetary and financial initiatives: Finance regaining its position as a servant of the economy. *Research in International Business and Finance*, 39, pp.750-760.
- Arestis, P. & Demetriades, P. (1992). Financial development and economic growth: assessing the evidence. *The Economic Journal*, 107(442), pp.783–799.

- Masten, A. B., Coricelli, F., and Masten, I. (2008). Non-linear growth effects of financial development: Does financial integration matter? *Journal of International Money and Finance*, 27(2), 295 – 313.
- Mukherjee, S. and Bhattacharya, R. (2011). “Inflation targeting and monetary policy transmission mechanisms in emerging market economies”, *IMF Working Paper No. WP/11/229*, International Monetary Fund.
- Arestis, P., and Demetriades, P. (1997), Financial Development and Economic Growth: Assessing the Evidence, *Economic Journal*, Vol.107, No. 442, pp.783-99.
- Aysun, U., Brady, R. & Honig, A. (2013). Financial frictions and the strength of the monetary transmission. *Journal of International Money and Finance*, 32, pp.1097–1119.
- Batuo, M. & Mlambo, K. (2012). *Financial liberalisation, banking crises and economic growth in African countries*. Germany, University Library of Munich.
- Beck, T., Demirgüç-Kunt, A. & Levine, R. (2000). *A new database on financial development and structure*. World Bank Policy Research Working Paper 2146. Washington, DC: World Bank.
- Beck, T., Lundberg, M. & Majnoni, G. (2006). Financial intermediary development and growth volatility: do intermediaries dampen or magnify shocks? *Journal of International Money and Finance*, 25(7), pp. 1146–1167.
- Bernanke, B.S. & Gertler, M. (1995). *Inside the black box: the credit channel of monetary policy transmission* (No. w5146). National Bureau of Economic Research.
- Boivin, J. & Giannoni, M.P.(2006). Has monetary policy become more effective? *The Review of Economics and Statistics*, 88(3), pp.445–462.
- Breyer, S.G. (1982). Two Models of Regulatory Reform. *SCL Rev.*, 34, pp.629.
- Carranza, L., Galdon- Sanchez, J.E. & Gomez- Biscarri, J.(2010). Understanding the relationship between financial development and monetary policy. *Review of International Economics*, 18(5), pp.849–864.
- Fowowe, B. (2011). Financial sector reforms and private investment in sub-Saharan African countries. *Journal of Economic Development*, 36(3). pp. 79.
- Goldsmith, R.W. (1969). *Financial structure and development* (No. HG174 G57).
- Goran, P., Hagg, T. (1997). Theories on the Economics of Regulation: A Survey of the Literature from a European Perspective, *European Journal of Law and Economics*, 4, pp.337-370
- Gurley, J.G. and Shaw, E.S. (1955). Financial aspects of economic development. *The American Economic Review*, 45(4), pp.515-538.

- Hansen, N.J.H. & Sulla, M.O. (2013). *Credit growth in Latin America: financial development or credit boom?* (No. 13-106). International Monetary Fund.
- Hicks, J. (1969). *A theory of economic history* (Vol. 163). Oxford: Oxford University Press.
- Ikhide, S. & Alawode, A.(2001). *Financial sector reforms, macroeconomic instability and the order of economic liberalisation: the evidence from Nigeria*. AERC Research Paper, 112. Nairobi (Kenya): African Economic Research Consortium.
- Ikhide, S.I. (1992). *Financial deepening, credit availability and the efficiency of investment: evidence from selected African countries*. Development Research Paper series, research paper No. 2.
- Jawadi, F., Mallick, S.K. & Sousa, R.M.(2016). Fiscal and monetary policies in the BRICS: a panel VAR approach. *Economic Modelling*, 58, pp.533–542.
- Keynes, J.M. (1936). *The general theory of interest, employment, and money*. London Macmillan.
- Khan, M.S. (2011). The design and effects of monetary policy in sub-Saharan African countries. *Journal of African Economies*, 20 (suppl 2):ii16–ii35.
- King, R.G. & Levine, R. (1993a). Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics*, 108(3), pp.717–737.
- King, R.G. & Levine, R. (1993b). Finance, entrepreneurship, and growth: theory and evidence. *Journal of Monetary Economics*, 32, pp. 513–542.
- Knoop, T.A. (2008). *Modern financial macroeconomics: panics, crashes, and crises*. Wiley-Blackwell.
- Levine, R. & Zervos, S. (1998). Stock markets, banks, and economic growth. *American Economic Review*, 88(3), pp.537–58.
- Levine, R. (1997). Financial development and economic growth: views and agenda. *Journal of Economic Literature*, 35(2), pp.688–726.
- Levine, R. (2003). More on finance and growth: more finance, more growth. *Federal Reserve Bank of St. Louis Review*, (Jul), pp.31–46.
- Loayza, N.V. & Ranciere, R. (2006). Financial development, financial fragility, and growth. *Journal of Money, Credit, and Banking*, pp. 1051–1076.
- Lucas, R.E., Jr. (1988). On the mechanics of economic development, *Journal of Monetary Economics* XXII, pp. 3-42.
- Ma, Y. & Lin, X. (2016). Financial development and the effectiveness of monetary policy. *Journal of Banking & Finance*, 68, pp.1–11.

- McKinnon, R.I. (1973) *Money and capital in economic development*. Brookings Institution, Washington, DC. 42.
- Ncube, M. (2005). *Financial systems and monetary policy in Africa* (No. 20). Economic Research Southern Africa.
- Ndebbio, J.E.U. (2004). *Financial deepening, economic growth, and development: evidence from selected sub-Saharan African countries*. AERC Research Paper, 142. Nairobi (Kenya): African Economic Research Consortium.
- Odhiambo, N.M. (2008). Financial depth, savings and economic growth in Kenya: a dynamic causal linkage. *Economic Modelling*, 25(4), pp.704–713.
- Odhiambo, N.M. (2014). Financial systems and economic growth in South Africa: a dynamic complementarity test. *International Review of Applied Economics*, 28(1), pp.83–101.
- Patrick, H.T. & Park, Y.C. (1994). *The financial development of Japan, Korea, and Taiwan: growth, repression, and liberalisation*. Oxford University Press on Demand.
- Pedroni, P. (1999). Critical values for cointegration tests in heterogeneous panels with multiple regressors. *Oxford Bulletin of Economics and statistics*, 61(s 1), pp.653-670.
- Pedroni, P. (2000). Fully modified OLS for heterogeneous cointegrated panels. *Advances in Econometrics*, 15, pp.93-130.
- Pedroni, P. (2004). Panel cointegration: asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. *Econometric theory*, 20(03), pp.597-625.
- Peltzman, S. (1974). *Regulation of pharmaceutical innovation: The 1962 amendments* (Vol. 15). American Enterprise Institute for Public Policy Research.
- Posner, R.A. (1974). Theories of Economic Regulation. *NBER Working Paper Series*, p.41.
- Robinson, J. (1952). *The generalization of the general theory of the rate of interest and other essays* (Macmillan, London).
- Rousseau, P.L. & Wachtel, P.(2011). What is happening to the impact of financial deepening on economic growth? *Economic Inquiry*, 49, pp.276–288.
- Sahay, R., Čihák, M., N'Diaye, P. & Barajas, A. (2015). Rethinking financial deepening: stability and growth in emerging markets. *Revista de Economía Institucional*, 17(33), pp.73–107.
- Schumpeter, J.A.(1911). *The theory of economic development: an inquiry into profits, capital, credit, interest and the business cycle*. Cambridge, MA: Harvard University Press.

Şen, H. & Kaya, A.(2015). *The relative effectiveness of monetary and fiscal policies on growth: what does long-run SVAR model tell us?* Germany: University Library of Munich.

Stigler, G.J.(1971). The theory of economic regulation. *The Bell journal of economics and management science*, pp.3-21.

Svirydzenka, K. (2016). *Introducing a new broad-based index of financial development*. International Monetary Fund.

Valencia, F. and Laeven, L., 2012. *Systemic banking crises database: An update* (No. 12-163). International Monetary Fund.

Table 6: Panel Estimation Results for selected SSA Countries: using money supply to gdp (m2_gdp) as a Dependent Variable

	System GMM regression			
Variables	Dyn Fixed effect	GLS Correlated	GLS hetero	Twostep
ggdp	-0.379***	0.119*	0.118	-0.160
	(0.145)	(0.0682)	(0.177)	(0.454)
fdi_gdp	0.232***	0.249***	0.458***	0.382**
	(0.0502)	(0.0500)	(0.142)	(0.194)
lr	0.168	0.188***	0.518***	
	(0.117)	(0.0403)	(0.0775)	
gfcf_gdp	0.778***	0.654***	1.225***	
	(0.131)	(0.0490)	(0.0669)	
gov_con	6.07e-10***	6.41e-10***	6.71e-10***	1.46e-10*
	(1.13e-10)	(0)	(0)	(8.35e-11)
inf_gdp	-0.0860	-0.0491*	-0.0911	-0.522***
	(0.0567)	(0.0289)	(0.0628)	(0.185)
fincrisis	-0.831	0.946	2.151	2,323**
	(5.925)	(1.632)	(3.405)	(1,128)
L.m2_gdp				1.755***
				(0.512)
Constant	21.54***	21.25***		
	(3.801)	(1.354)		
Arellano Bond Test Autocorrelation order 2		0.445	YES	0.2832
Hansen Sargen test			YES	
Number of countries id	10	10	10	10

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author computation

Table 7: Panel Estimation Results for selected SSA Countries: using domestic credit to private sector (Dc_gdp) as a dependent Variable

VARIABLES	System GMM regression			
	Dyn Fixed effect	GLS Correlated	GLS hetero	Twostep
ggdp	-0.0242 (0.208)	0.0532 (0.0640)	-0.0687 (0.179)	0.325 (0.380)
fdi_gdp	0.311*** (0.0720)	0.220*** (0.0605)	0.407*** (0.138)	1.656* (0.988)
lr	-0.222 (0.168)	0.176*** (0.0389)	0.651*** (0.0870)	
gfcf_gdp	0.493*** (0.187)	0.246*** (0.0402)	0.479*** (0.0651)	
gov_con	1.25e-09*** (1.63e-10)	1.85e-09*** (5.09e-11)	1.91e-09*** (8.14e-11)	0 (4.10e-10)
inf_gdp	-0.133 (0.0812)	-0.120*** (0.0290)	-0.146** (0.0722)	0.0102 (0.0515)
fincrisis	10.66 (8.489)	5.816*** (1.683)	11.83*** (4.058)	145.4 (118.6)
L.dc_gdp				0.178 (0.352)
Constant	18.53***	13.53***		
Number of country_id	10	10	10	10
Arellano Bond Test Autocorrelation order 2		0.250	YES	0.7585
Hansen Sargen test			YES	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author computation

Table 8: Panel Estimation Results for selected Sub-Saharan African Countries: using (credit to the private sector) dc_gdp as a Dependent Variable

VARIABLES	Arellano Bond System regression		
	Arellano Bond 1	Arellano Bond 2	Blundell Bond
L.dc_gdp	0.728*** (0.0608)	0.388*** (0.0571)	0.847*** (0.0263)
L2.dc_gdp		0.412*** (0.0568)	
ggdp	-0.174*** (0.0508)	-0.121 (0.132)	-0.173 (0.145)
fdi_gdp	0.143*** (0.00987)	0.0934** (0.0433)	0.166*** (0.0405)
gfcf_gdp	0.0781 (0.159)	0.109 (0.136)	
inf_gdp	-0.130*** (0.0240)	-0.104* (0.0559)	-0.168*** (0.0537)
inf_cpi	-0.126 (0.114)	-0.160** (0.0802)	
fincrisis	1.704 (2.684)	0.838 (5.081)	0.871 (5.872)
Constant	10.97* (6.447)	8.041** (3.279)	7.655*** (1.302)
Number of countries id	10	10	10
Observations	340	330	350

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Author computation

Table 9: Panel Estimation Results for selected Sub-Saharan African Countries: using money supply as a Dependent Variable

VARIABLES	Arellano Bond System regression		
	Arellano Bond 1	Arellano Bond 2	Blundell Bond
L.m2_gdp	0.695***	0.446***	0.782***
	(0.118)	(0.0560)	(0.0272)
L2.m2_gdp		0.321***	
		(0.0579)	
ggdp	-0.366*	-0.380***	-0.373***
	(0.193)	(0.0884)	(0.0905)
fdi_gdp	0.133***	0.0965***	0.215***
	(0.00543)	(0.0283)	(0.0283)
gfcf_gdp	0.126	0.0856	
	(0.129)	(0.0915)	
inf_gdp	-0.178***	-0.180***	-0.220***
	(0.0394)	(0.0365)	(0.0326)
inf_cpi	0.0147	0.00602	
	(0.0387)	(0.0520)	
fincrisis	-1.493	-2.042	-1.707
	(1.618)	(3.332)	(3.562)
Constant	13.33***	11.34***	12.54***
	(4.758)	(2.306)	(1.330)
Number of countries id	10	10	10
Observations	340	330	350

Robust standard errors in parentheses

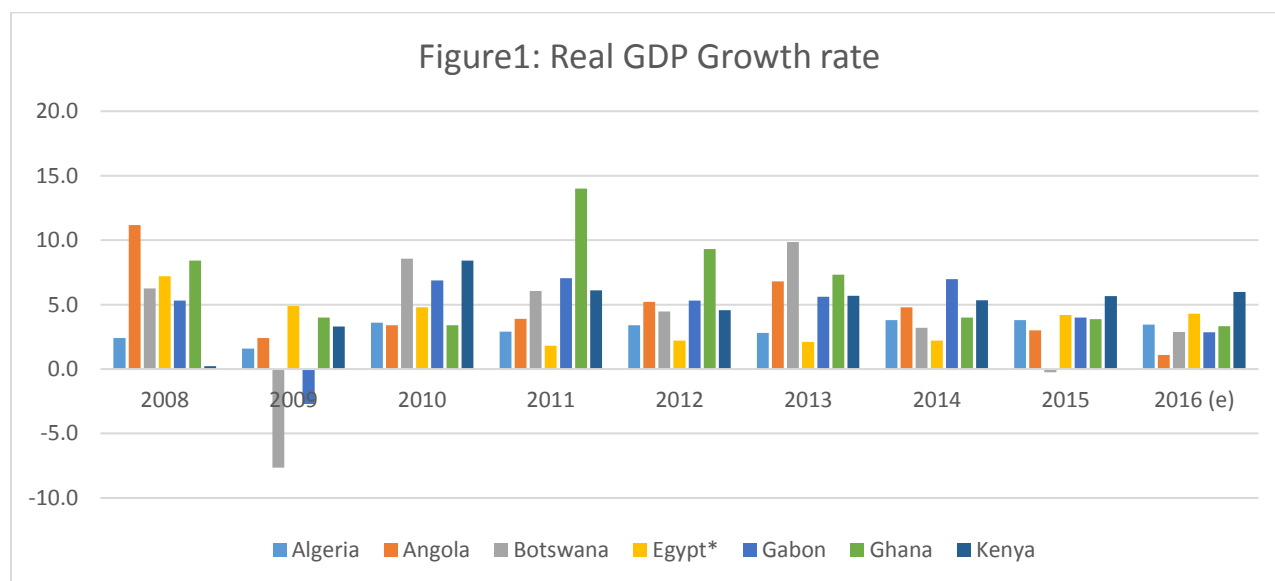
*** p<0.01, ** p<0.05, * p<0.1

Source: Author computation

Table 10. Monetary indicators, 2015-18

	Inflation				Exchange rate			Broad money (LCU billion)			Reserves, excluding gold,	
	2015	2016 (e)	2017 (p)	2018 (p)	(LCU / USD)			2016			(USD million)	
					2014	2015	2016	Level	% of GDP	Growth 2015/2016	Stock at year-end	Eq. months of imports
Algeria	4.8	6.4	4.0	4.0	81	100	109	14,488	78.8	5.7	114 653	24.0
Botswana	3.1	2.8	3.5	3.7	9	10	11	76	54.7	6.3	7 846	13.4
Egypt*	11.0	10.1	16.9	12.9	7	7	8	2,095	91.2	18.6	19 654	4.1
Gabon	2.3	2.6	2.5	2.5	494	591	603	2,301	25.9	5.1	1 365	2.9
Ghana	17.2	17.0	10.5	7.2	3	4	4	52	41.9	14.4
Mauritius	1.3	1.3	2.5	2.7	31	35	35	460	93.9	8.0	4 523	6.8
Namibia	3.4	6.7	6.0	5.2	11	13	15	91	57.9	11.1	1 727	2.9
Nigeria	9.1	15.7	14.3	12.4	159	192	197	22,715	22.2	14.0	30 640	6.3
Seychelles	4.0	-0.1	2.6	3.8	13	13	13	13	51.2	4.4	524	3.5
South Africa	4.6	6.4	6.1	5.6	11	13	15	3,170	77.0	6.5	42 413	5.5

Sources: AfDB Statistics Department, various domestic authorities; International Financial Statistics and AfDB (e) estimates and (p) projections.



Sources: AfDB Statistics Department, various domestic authorities; International Financial Statistics and AfDB (e) estimates and (p) projections.